In conclusion, I desire to make the following suggestions:—

First. It is evident that the study of the phenomenon of cross-fertilization of flowers by means of insects is still a profitable field for observation and discovery.

Second. The effect of external conditions in reference to dichogamy should be the subject of critical experiments.

Third. Teleological explanations should be avoided as much as possible, here as elsewhere, according to the spirit of modern investigation.

Finally. The relative number of cases of cross- and close-fertilization should be compared, and it should be determined if cross-fertilization actually takes place in all cases where this is assumed.

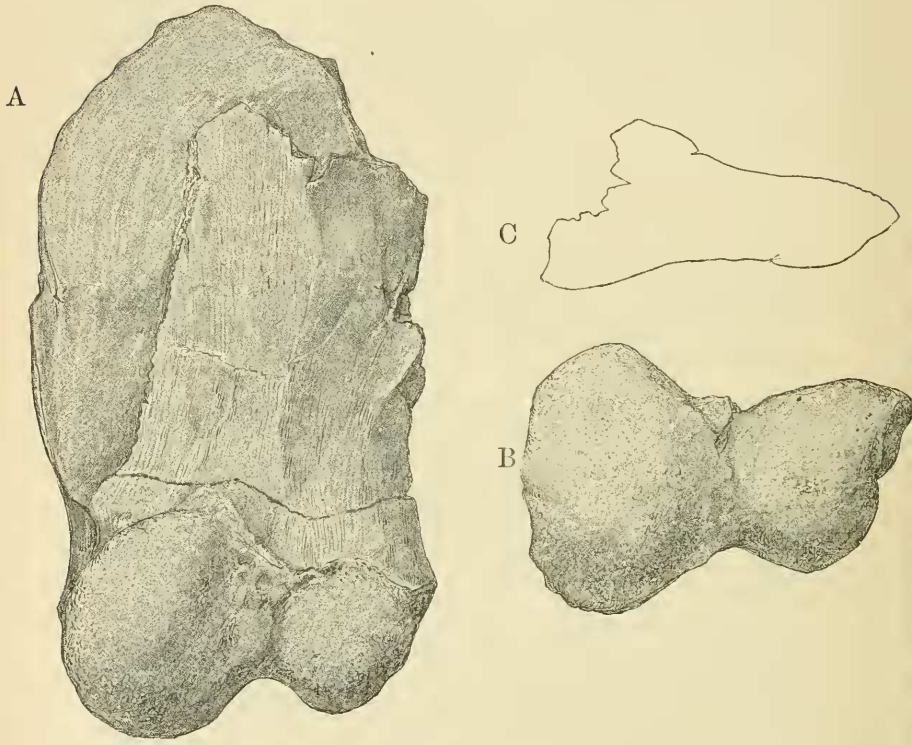
XXXVI.—*On the Quadrate Bone of a Gigantic Pterodactyl discovered by Joseph Mawson, Esq., F.G.S., in the Cretaceous of Bahia, Brazil.* By A. Smith Woodward, F.L.S., F.G.S.

Nearly five years ago Mr. Joseph Mawson discovered the first evidence of Pterodactyls in the rocks of the Southern Hemisphere, consisting of two fragmentary quadrate bones from the Cretaceous of Bahia, Brazil*. Quite recently he has returned from a further examination of the cliffs and shore-reefs in the same district, and now he has obtained another example of the same bone, interesting not only on account of the locality, but also as belonging probably to the most gigantic Pterodactyl hitherto recorded.

The new specimen, shown from the posterior and articular aspects and in transverse section in the accompanying figures, belongs to the right side of the head. A little more of its proximal portion is preserved than in the previous example, but the pterygoid plate is similarly broken away, the facette for its articulation alone being indicated. The bone is much compressed antero-posteriorly, its outer margin being a sharp edge, and a transverse fracture immediately above the condyles (fig. C) shows that its lower portion is solid. The

* A. S. Woodward, "Evidence of the Occurrence of Pterosaurians and Plesiosaurians in the Cretaceous of Brazil, discovered by Joseph Mawson, Esq., F.G.S.," Ann. & Mag. Nat. Hist. [6] vol. viii. (1891), p. 314, fig. 2.

upper portion may have been hollow, but there is no pneumatic foramen such as often occurs on the hinder face of this element. Both faces are flattened, but the anterior one is slightly concave from side to side above, and the posterior one (fig. A) is remarkable for its relatively great width in the upper part. The facette for the pterygoid lamina extends downwards almost as far as the inner articular condyle and is obscured by adherent matrix; but its boundaries are clear,



Right quadrate bone of a Pterodactyl, natural size, from the posterior (A) and articular (B) aspects, and in transverse section (C). Cretaceous, Plataforma, Bahia, Brazil. [Mawson Collection, British Museum.]

and the transverse fracture shows that it was coarsely rugose and ridged as in the previous small specimen from Brazil. The articular end of the bone (fig. B) exhibits the usual lack of bilateral symmetry. The condyles are a little abraded, though apparently not much damaged, and are particularly remarkable both for their inequality in size and their tumid

form. The inner is very much larger than the outer condyle, and the valley between the two is sharply angulated.

Compared with the Pterodactylian quadrates already discovered by Mr. Mawson in the same formation and locality, the new specimen is about three times as large, and differs in the marked inequality of the articular condyles, as also in their less oblique disposition. The new fossil, however, agrees with the others in having these condyles remarkably tumid and separated by a narrow sharp valley, thus resembling the corresponding bones of the Jurassic * rather than those of Cretaceous age †. So far as yet known, indeed, the articular end of the quadrate in Cretaceous Pterosaurian genera is almost saddle-shaped, with acute lateral borders.

Not being able to determine the genus of the Brazilian Cretaceous Pterodactyl, it is equally impossible to estimate the size of the skull or the animal itself from a single bone. There is too much variation in the proportions of the snout and the relative dimensions of the head among Pterodactyls to admit of any such induction. To judge by Marsh's figure of the skull of *Pteranodon*, however, the Brazilian form must have even exceeded in size the gigantic species of this North-American genus, of which the head sometimes attains a length of 4 feet.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

January 22, 1896.—Dr. Henry Woodward, F.R.S., President, in the Chair.

The following communications were read :—

1. 'On some Podophthalmous Crustaceans from the Cretaceous Formation of Vancouver and Queen Charlotte Islands.' By Henry Woodward, LL.D., F.R.S., P.G.S.

This paper contains descriptions of several crustaceans from the Cretaceous coal-bearing strata of Vancouver and Queen Charlotte Islands, sent to the Author by J. F. Whiteaves, Esq., F.G.S.,

* R. Lydekker, "On certain Ornithosaurian and Dinosaurian Remains," Quart. Journ. Geol. Soc. vol. xlvii. (1891), p. 41, pl. v. figs. 3, 4.

† H. G. Seeley, 'The Ornithosauria' (1870), p. 90, pl. xi. figs. 16, 17. See also figure of quadrate of *Pteranodon* (no description) by O. C. Marsh, Amer. Journ. Sci. [3] vol. xxvii. (1884), pl. xv.